

Shedding Light on Crime in Boston

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Motivation

What makes some Boston neighborhoods safer than others? What can the city of Boston do to help reduce crime rates? Since many factors influence crime, we chose to focus on those which can be most easily controlled, such as infrastructure and placement of safety resources. We hope to answer our questions by (1) analyzing the relationship between street lights and crime incidence, and (2) determining potential optimal locations for night patrols.

Datasets

Source: Analyze Boston

- Boston Neighborhoods
- Boston Street Segments
- Streetlight Locations
- Crime Incident Reports

Initial Transformations:

- Assign each crime incident to a geo location based on the street on which it occurred
- Aggregate crime and streetlight data to the neighborhood level based on geographic coordinates

Future Work

In order to improve coverage of crimes, we could explore more factors that affect crime incidence such as economic conditions and proximity to public transport. Understanding the relationship between these factors and crime rates could help us determine more intelligent locations to place patrols or other safety resources.

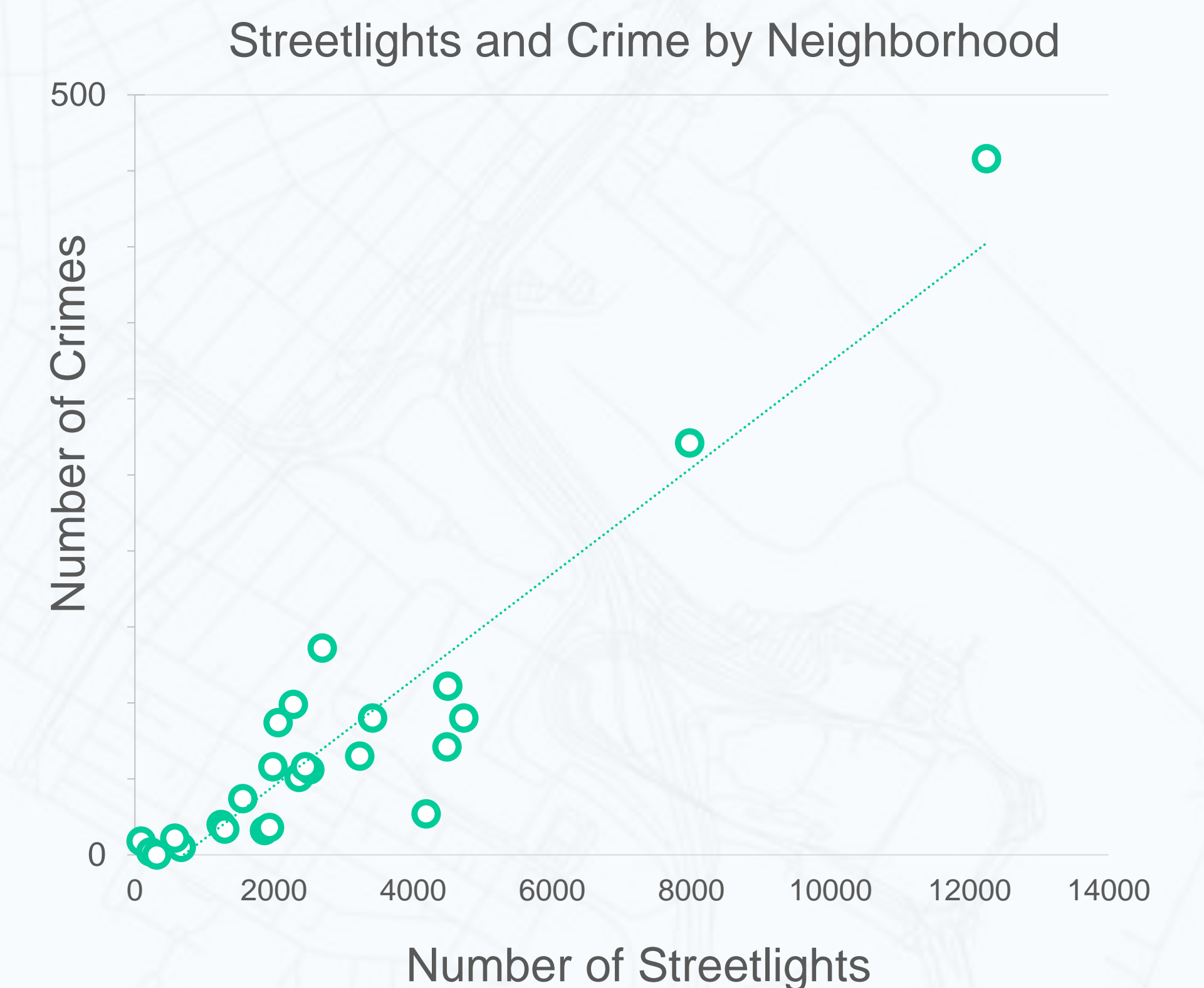
Problem: Light and Crime

Question: Is there a correlation between increased outdoor lighting and crime?

Method: We ran a correlation between the number of streetlights and the number of crimes reported in each Boston neighborhood.

Results: correlation coefficient = +0.9375

Conclusion: Our results suggest a positive correlation between number of streetlights and the number of crimes in a neighborhood. Since we did not consider factors such as size of neighborhood, we cannot reasonably conclude increasing outdoor light has any effect on crime rates.



Solution: Optimized Patrol Locations

Question: Where can we optimally place patrol cars so that every street is covered within a specified distance?

Method: Using z3 Constraint Satisfaction, we determined a model that for each neighborhood, tells us the minimum number of night patrols needed such that every street where a crime occurred will be covered.

Results: Optimal patrol placement for Downtown neighborhood at 600ft (see map)

Conclusion: The city of Boston can keep streets safer by intelligently placing patrols so that streets where crimes occur are covered within a certain number of feet.

